Supplementary Material (ESI) for Chemical Communications

Electronic Supplementary Information for:

Photoinduced Diffusive Mass Transfer in *o*-Cl-HABI Amorphous Thin Film

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1. **Characterization of *o*-Cl-HABI Amorphous thin films**

Figure S1 shows the DSC profile of the spin-coated film, where a clear shift in the baseline was observed at 366 K. This change in the heat capacity is a characteristic feature of the glass transition. This observation also supports the amorphous character of the spin-coated film. Figure S2 shows the XRD pattern of the film spin-coated on a nickel plate from the benzene solution of *o*-Cl-HABI. No diffraction peaks attributable to that of crystalline state support that the spin-coated film is in the amorphous solid state. Figure S3 shows the time profile of the absorbance of *o*-Cl-TPIR at 550 nm of the amorphous film measured at 383 K. *o*-Cl-TPIR recombines within *ca*. 6 ~10 s in an amorphous film at 383 K.

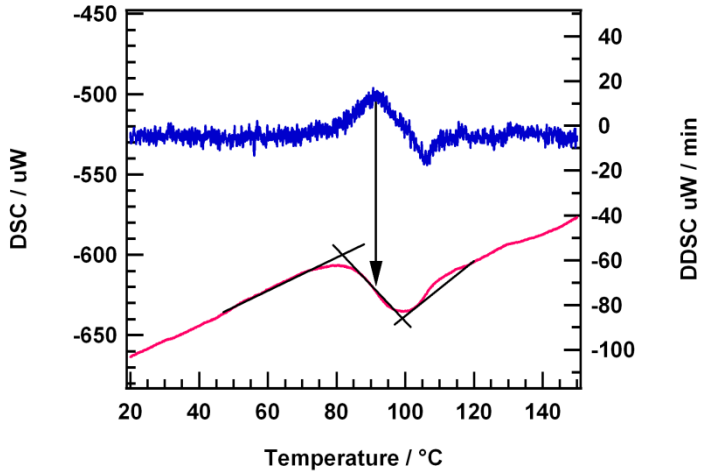

Fig. S1 DSC profile of the spin-coated film with temperature scanning rate of 5 °C /min.

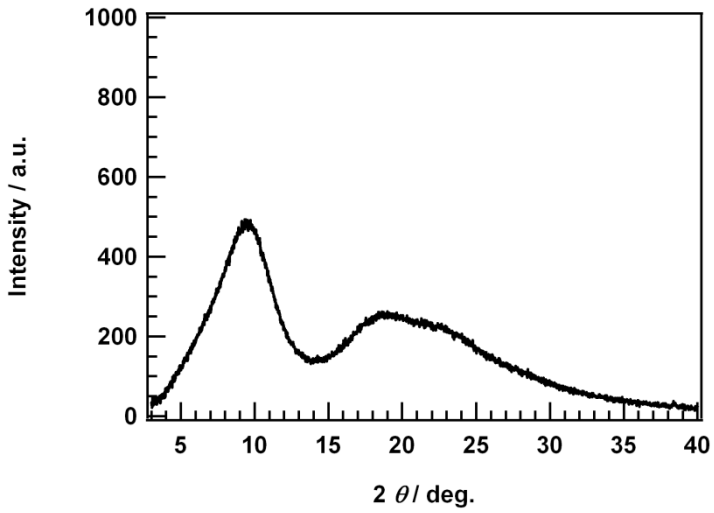

Fig. S2 XRD pattern of the film spin-coated on a nickel plate from the benzene solution of *o*-Cl-HABI.

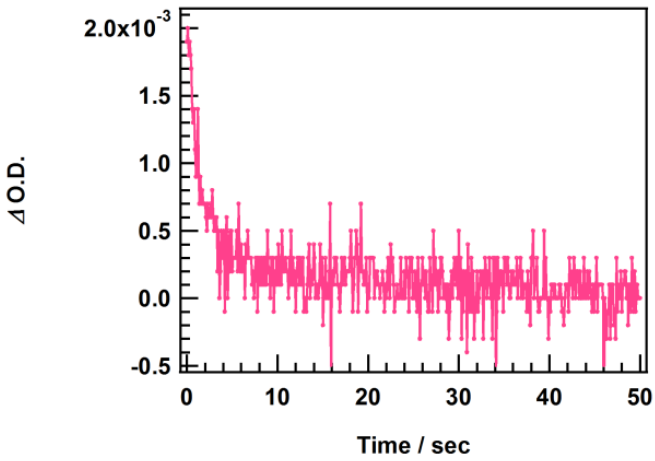

Fig. S3 The time profile of the absorbance of *o*-Cl-TPIRs monitored at 550 nm in the amorphous film at 383 K under Ar atmosphere.

2. **The stability of the SRG structures**

It is important to note here that we carried out the SRG formation with great care because the stable photoproducts other than *o*-Cl-HABI might affect the SRG formation (22mW cm^{-1}, 10 min, at 383 K under Ar atmosphere) of *o*-Cl-HABI amorphous thin films at 383 K. The thermal bleaching rate of the SRG is very slowly at 383 K. We observed the stability of the SRG at room temperature, 383 K and 393 K. After SRG formation on *o*-Cl-HABI amorphous thin film produced by light irradiation, the SRG structures was stable and remained unchanged at least a

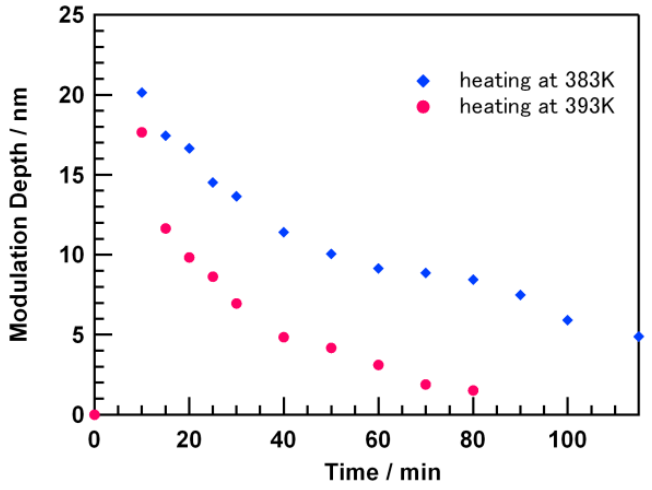

Fig. S4 The thermal bleaching rate of the SRG at 383 K and at 393 K in the *o*-Cl-HABI amorphous film. (22mW cm^{-1}, 10 min, at 383 K under Ar atmosphere).

month at room temperature until the crystallization of *o*-Cl-HABI amorphous thin film. On the other hand, the SRG depth profile gradually decreased at 393 K in *ca*. 80 min (see Figure S4).

3. **The dependence of the *o*-Cl-HABI film thickness on the concentration of *o*-Cl-HABI benzene solution.**

   The film thickness depends on the concentration of the *o*-Cl-HABI benzene solution in preparation.

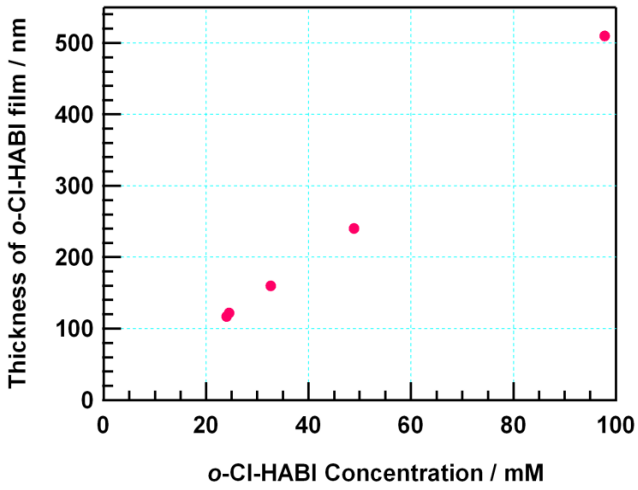

Fig. S5 The dependence of the *o*-Cl-HABI film thickness on the concentration of *o*-Cl-HABI solution.